84605

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S/181/60/002/010/028/051
B019/B056

AUTHORS: Plotnikov, Yu. I. and Matalygina, Zh. I.

TITLE: I. Photoelectromotive Forces in Anthracene

PERIODICAL: Fizika tverdogo tela, 1960, Vol. 2, No. 10, pp. 2517-2525

TEXT: The authors give the results of an investigation of the photo-electromotive forces which are generated in an anthracene sample irradiated with intermittent light (λ = 3650 A). This wavelength corresponds to the main absorption region of anthracene. The sample was also irradiated with non-monochromatic light (λ > 3100 A). A mercury quartz lamp served as a light source, and suitable filters gave the wavelengths necessary for the experiments. The interruption of the light ray was produced by means of a rotating disk, which was driven by an electromotor. The monocrystalline samples were bred according to a method suggested by Lipsett (Ref. 15), and the polycrystalline ones by sublimation in vacuo. The samples investigated had different kinds of pulses of the photo-emf, as regards their shape and polarity. Freshly

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produced monocrystalline samples had at first positive pulses. After several seconds, these positive pulses vanished, and negative pulses of the photo-emf appeared. The oscillogram in Fig. 3 has a negative pulse at a temperature of 18°C. On polycrystalline samples also, the authors were able to prove the existence of positive pulses; however, the latter did not change. The phenomena on the single crystalline samples are explained as due to photochemical processes on the anthracene surface. Figs. 5 to 7 show the dependence of the above described effects on the irradiation intensity and the temperature. Summarizing, it is stated that in the irradiation of anthracene with ultraviolet light (λ = 3650 A), the light is adsorbed in a layer of thickness 10^{-4}cm. In this layer, excitons are generated, which are looked upon as moving excitation processes in molecular crystals. In the case of a weak exciton-phonon coupling, the exciton decay may occur either on the defects or on the surface of the sample. In this case, either a nonradiative mechanism is possible, or a de-excitation of a luminescence quantum, or also the production of an electron-hole pair. In the case of increases of temperature, these processes may occur not only on the defects, but also as the result of

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exciton-phonon interaction. As the diffusion length of the excitons in anthracene is not greater than 0.15 micron, it may be assumed that the production of electron-hole pairs takes place in the same surface layer in which the light is absorbed. The holes, which have greater mobility, generate the positive pulses. On the action of light having a wavelength less than 4000 A, a photochemical change occurs in the presence of the air-oxygen on non-purified surfaces. In this way, products of a photo-oxidation of anthracene occur near the layer in which the carriers are produced, which have an affinity to holes. The settling of holes on the adhesion levels leads to a decrease of the positive pulses. The anthracene used came from the Khar'kovskiy zavod khimicheskikh reaktivov (Khar'kov Factory of Chemical Reagents). Ye. K. Putseyko (Ref. 12); F. I. Kolomoytsev and A. Ya. Yakunin (Ref. 13); V. P. Zhuze and S. M. Ryvkin (Ref. 14); and Spendiarov and Aleksandrov (Ref. 16) are mentioned. There are 7 figures and 24 references: 11 Soviet, 8 US, 3 British, 1 German, and 1 Canadian.

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I. Photoelectromotive Forces in Anthracene S/181/60/002/010/028/051
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ASSOCIATION: Moskovskiy inzhenerno-fizicheskiy institut (Moscow Institute of Physics for Engineers)

SUBMITTED: April 4, 1960 (after revision)

Card 4/4

ACCESSION NR: AR4040828 S/0058/64/000/005/E050/E050

SOURCE: Ref. zh. Fizika, Abs. 5E381

AUTHOR: Plotnikov, Yu. I.

TITLE: The kinetics of photo-electromotive force in anthracene

CITED SOURCE: Izv. Leningr. elektrotekhn. in-ta, vy*p. 51, 1963, 155-159

TOPIC TAGS: photoelectromotive force, anthracene, single crystal, electromotive force

TRANSLATION: With a duration of illumination $t \approx 1$ msec on pure polycrystalline and single crystal samples of anthracene there are observed positive pulses of the photocurrent with a constant of drop $\tau \approx 2.8$ msec and on samples, subjected to photochemical changes, negative pulses with $\tau \approx 1$ msec. For positive pulses τ does not change noticeably with temperature, while for negative pulses, τ decreases with a rise in temperature. Polarity of the pulses depends only on the purity of the sample. The nature of the observed electromotive force is nondirectional. How-

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ACCESSION NR: AR4040828

ever, at $t \gtrsim 10$ msec the electromotive force had identical polarity both in pure and in photochemically modified samples. The build-up process is exponential; $\tau \approx 0.1$ second. It is shown that in this case the processes encompass the whole crystal, whereas at small t they are of a more front-wall character. At large t, apparently there occur photoelectrochemical processes. At small t, however, the appearance of photo-electromotive force is connected with diffusion of the light current carriers.

SUB CODE: OC, EM ENCL: 00

Card 2/2

S/120/63/000/001/020/072
E140/E135

AUTHORS: Plotnikov, Yu.I., and Gorbatov, A.A.

TITLE: Recording electrometer for the study of induced e.m.f.

PERIODICAL: Pribory i tekhnika eksperimenta, no.1, 1963, 92-94

TEXT: A recording electrometer has a sensitivity of 4 mV for half-screen deflection of the light beam in an electro-mechanical oscillograph. The input impedance can be varied between 10^6 and 10^{12} ohm. The zero drift does not exceed 1 mV during 12 hours. The designers had difficulty with the drift in characteristics of the output stage, due to variations in anode temperature with variation in output current.
There is 1 figure.

ASSOCIATION: Moskovskiy inzhenerno-fizicheskiy institut (Moscow Engineering-Physics Institute)

SUBMITTED: April 6, 1962

Card 1/1

S/181/62/004/011/011/049
B102/B104

AUTHOR: Plotnikov, Yu. I.

TITLE: The temperature dependence of the dark currents in anthracene

PERIODICAL: Fizika tverdogo tela, v. 4, no. 11, 1962, 3104 - 3109

TEXT: The values for the thermal activation energy E of volume and surface currents in anthracene crystals vary between 1.4 and 2.7 ev as given by various authors (e.g.,Proc. Phys. Soc. 74, 756, 1959; Bull. Chem. Soc. Japan, 29, 131, 1956; Proc. Roy. Soc. A234, 124, 1956). Measurements have recently been made in order to obtain more accurate values. The samples used were polycrystalline and monocrystalline, prepared by various methods. The base substance was synthetic anthracene purified by zone melting. Single crystals were grown in the melt and also in the solution, polycrystals obtained by sublimation in vacuo on a PbO coated quartz glass base. Samples kept in air for a short time showed no influence of the oxygen. The measurements were made in purified nitrogen. The electrodes were brass, Al or Pt attached to surfaces of the samples with Aquadag.
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The temperature dependence ...

Within a temperature range of 75-115°C the temperature dependence of the dark current is stationary and can be expressed by $I = I_o \exp(-E/2kT)$. The slope of the curves was found to be $\ln I = f(1/T)$, indicating that E does not depend either on the method by which the sample was obtained or on the type of crystal used. E also was independent of the crystallographic direction, equal to 1.98 ±0.04 ev. for the surface current and for the volume current. When the measurements were made in oxygen or air the values of E ranged from 1.46 to 1.60 ev. Since E is considerably smaller than the singlet level $^1E_1$(3.10 ev) the first stage of the carrier production in anthracene cannot be attributed to the excitation of this singlet level. E is also found above the triplet level $^3E_1$(1.64 ev), $E - {}^3E_1$ might also give the thermal activation energy of the carrier mobility: in fact it is equivalent to the photocurrent thermal activation energy, 0.34 ev. (Canad. J. Chem. 35, 998, 1957). There are 3 figures and 2 tables.

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S/181/62/004/011/011/049
B102/B104

The temperature dependence ...

ASSOCIATION: Moskovskiy inzhenerno-fizicheskiy institut (Moscow Institute of Physical Engineering)

SUBMITTED: June 5, 1962

Card 3/3

MALEVANAYA, S.V.; PLOTNIKOV, Yu.I.

Methods for controlling the discharge and circuits for automatic charging of alkaline storage batteries. Biul.tekh.-ekon.inform. no.8:18-20 '61. (MIRA 14:8)

(Storage batteries)

PLOTNIKOV, Yu.I.; MATALYGINA, Zh.I.

Photo-e.m.f. forces in anthracene. Part 1. Fiz. tver. tela 2 no.10:2517-2525 '60. (MIRA 13:12)

1. Moskovskiy inzhenerno-fizicheskiy institut.
(Photoelectricity) (Anthracene--Electric properties)

PLOTNIKOV, Yu.I.

Electrometer converter using variconds. Izv.vys.ucheb.zav.; radiotekh. 2 no.4:485-487 Jl-Ag '59. (MIRA 13:2)

1. Rekomendovano kafedroy fiziki Moskovskogo inzhenerno-fizicheskogo instituta.
(Electronic measurements)

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SOV/142-2-4-14/26

9 (2)

AUTHOR: Plotnikov, Yu. I.

TITLE: An Electrometer Transducer With Ceramic Capacitors

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiotekhnika, 1959, Nr 4, Vol 2, pp 485-487 (USSR)

ABSTRACT: The author describes the use of piezoceramic capacitors as transducer elements in electrometer circuits. The dynamic capacitance of a capacitor made of VK-2 ceramic may be easily changed by six to eight times, which corresponds to a modulation factor of 0.7. According to T.N. Verbitskaya [Ref 5], the capacitance of a piezoceramic capacitor will change in the longitudinal and in the transverse field. Based on this observation, a special 0.8x5x8 mm capacitor was used, made of a VK-2 ceramic plate with four terminals in two mutually perpendicular directions with [illegible] capacitances of 20 and 1000 picofarads, respectively. The higher capacitance was used for the modulation. A hysteresis loop was obtained, as shown in the oscillogram in

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An Electrometer Transducer With Ceramic Capacitors

tional ceramic capacitor. The transducer may be used in a wide frequency range, while reed vibrators will hardly exceed 100 cps. The transducer may be improved with a future progress in the technology of producing piezoceramics and may be used for building electrometers. The author expresses his gratitude to S.S. Smirnov, who participated in this work. The publication of this article was recommended by the Department of Physics of the Moskovskiy inzhenerno-fizicheskiy institut (Moscow Physics Engineering Institute). There are 2 circuit diagrams, 1 oscillogram and 7 references, 5 of which are Soviet and 2 English.

SUBMITTED: January 24, 1959 (November 24, 1958)

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Fig 3, when a voltage of 250 volts was applied at the modulating electrodes. The oscillogram was obtained according to D.M. Kazarnovskiy's method [Ref 6]. The piezoceramic transducer was used in a circuit arrangement, shown in the circuit diagram in Fig 2. This circuit arrangement includes an alternating current amplifier and a rectifier. For compensation of linear inductions and phase shift, a differentail stage and a phase shifter are used. The transducer showed during tests at 1900 cps a sensitivity of $1.2 \cdot 10^{-12}$ amps at a direct current input resistance of $6 \cdot 10^{12}$ ohms, corresponding to the leakage resistance of the piezoceramic capacitor. The maximum zero drift within 12 hours did not exceed $3 \cdot 10^{-11}$ amps. Frequency fluctuations had a strong influence on the drift. The transducer described by the author is inferior in its characteristics to the best designs of mechanical dynamic capacitors, but it has also a number of advantages. Above all, it is cheap. Its manufacture is similar to that of a conven-

PLOTNIKOV, Yu.K.

Thiodipin in the therapy of chronic lymphatic leukemia. Vop. onk. 11 no.6:41-44 '65. (MIRA 18:8)

1. Iz kliniki gospital'noy terapii (zav. - prof. A.I.Germanov) Kuybyshevskogo meditsinskogo instituta (rektor - prof. I.V.Sidorenkov).

PLOTNIKOV, Yu.K.

Iron metabolism in chronic lymphatic leukemia. Ter. arkh. 35 no.4:79-86 Ap'63 (MIRA 17:1)

1. Iz kliniki gospital'noy terapii (zav. - prof. A.I.Germanov) Kuybyshevskogo meditsinskogo instituta.

MASHKOVICH, K.A.; ZINGER, A.S.; PLOTNIKOV, Yu.N.

Interpretation of the natural thermal field in the lower Volga Valley. Geol. nefti i gaza 9 no.9:41-45 S '65. (MIRA 18:9)

1. Nizhne-Volzhskiy nauchno-issledovatel'skiy institut geologii i geofiziki.

SHUYKIN, N. I.; TIMOFEYEVA, Ye. A.; PLOTNIKOV, Yu. N.; DOBRYNINA, T. P.; PETRYAYEVA, G. S.; SMIRNOV, V. S.

Preparation of C_6 - C_{10} alkenes by the catalytic dehydrogenation of alkanes. Neftekhimia 2 no.4:457-466 Jl-Ag '62. (MIRA 15:10)

1. Institut organicheskoy khimii AN SSSR imeni N. D. Zelinskogo.

(Paraffins) (Olefins) (Dehydrogenation)

PLOTNIKOV, Yu. N.; SMIRNOV, V.S.; TIMOFEYEVA, Ye. A.; KLEYMENOVA, V.M.; SHUYKIN, N.I.

Dehydrogenation of n-alkanes in a fluidized bed of oxide catalysts. (MIRA 14:6)
Kin. i kat. 2 no.2:267-272 Mr-Ap '61.

1. Institut organicheskoy khimii imeni N. D. Zelinskogo AN SSSR.
(Paraffins)
(Dehydrogenations)

SHUYKIN, N.I.; TIMOFEYEVA, Ye.A.; PLOTNIKOV, Yu.N.; ANDREYEV, N.S.

Composition of the products from the dehydrogenation of n-alkanes C_6-C_9 on an alumina-chromium oxide-potassium oxide catalyst. Izv. AN SSSR. Otd. khim. nauk no.12:2173-2177 D '60. (MIRA 13:12)

1. Institut organicheskoy khimii im.N.D.Zelinskogo AN SSSR.
(Paraffins) (Olefins)

ZINGER, A.S.; PLOTNIKOV, Yu.N.

Oil- and gas-field waters in the lower Volga Valley. Geol. nefti i gaza 4 no. 12:37-41 D '60. (MIRA 13:12)

1. Nizhne-Volzhskiy filial Vsesoyuznogo nauchno-issledovatel'skogo geologo-razvedochnogo neftyanogo instituta.
(Volga Valley--Oil field brines)

2

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S/062/60/000/008/022/033/XX
B013/B055

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AUTHORS: Shuykin, N. I., Timofeyeva, Ye. A., Dobrynina, T. P., Plotnikov, Yu. N., Petryayeva, G. S., and Gayvoronskaya, G. K.

TITLE: Catalytic Dehydrogenation of Isohexanes

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1960, No. 8, pp. 1457-1465

TEXT: The present paper is a continuation of the investigation into the dehydrogenation of hydrocarbons of different structures over an aluminum-chromium-potassium catalyst. The catalyst is discussed in detail in Ref.1. The 2-methyl pentane, 3-methyl pentane, and 2,3-dimethyl butane used in this investigation were prepared by the Grignard reaction. 2,2-dimethyl butane was obtained by pyrolysis of pinacoline alcohol acetate (Ref. 2). The experiments were carried out in a continuous system, at 500°C and atmospheric pressure and a flow rate of 0.5 h^{-1}. The catalyst was regenerated after every experiment by oxidation in air at 700°C. The properties of the isohexane catalyzates are listed in Table 1 and the

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composition of the gases formed in Table 2. For comparison, the corresponding data for n-hexane are also given. As is shown, dehydrogenation of 2-methyl pentane, 3-methyl pentane and 2,3-dimethyl butane yields 34-40% unsaturated hydrocarbons. Isohexanes form up to 2% and n-hexane up to 43% aromatic hydrocarbons. 2,2-dimethyl butane was found to form 15% unsaturated hydrocarbons. Formation of aromatic hydrocarbons was not observed. The gaseous products formed from 2-methyl pentane, 3-methyl pentane and 2,3-dimethyl butane contained 84 - 90% hydrogen, 9 - 12% methane, ethane, and propane, and 1 - 4% of other alkenes and alkanes. The gas obtained from 2,2-dimethyl butane contained 72.6% hydrogen, 21.2% C_1-C_3 alkanes and 6.2% of other hydrocarbons. These data show that 2,2-dimethyl butane is less stable under the given conditions than all other isohexanes. This conclusion was confirmed by the examination of the liquid catalyzates. Analytical data on the catalyzate composition allow the conclusion that, in hydrogenation under the given conditions, all the isohexanes form alkenes containing essentially 6 carbon atoms. Isomerization was not observed in dehydrogenation of 3-methyl pentane. Slight isomerization occurred during dehydrogenation of 2-methyl pentane and 2,3-dimethyl butane. 2,2-dimethyl butane formed alkenes during the catalytic reaction. Approximately half of these alkenes were isomerization products: 4-methyl 2-pentene,

Catalytic Dehydrogenation of Isohexanes

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2-methyl 2-pentene and 2,3-dimethyl 1,3-butadiene. Finally, a thermodynamic calculation of the reaction isohexanes $\rightleftarrows$ isohexenes was carried out (Table 8, Fig. 2). It is evident from the results obtained that the experimental yields of isohexenes approach the equilibrium yields. Fig. 1 represents chromatograms of an artificial hydrocarbon mixture and several fractions of isohexane catalyzates. The authors thank R. N. Shafran for carrying out the analysis of the gases. There are 2 figures, 9 tables, and 9 references: 7 Soviet, 1 US, and 2 British.

ASSOCIATION: Institut organicheskoy khimii im. N. D. Zelinskogo Akademii nauk SSSR
(Institute of Organic Chemistry imeni N. D. Zelinskiy of the Academy of Sciences USSR)

SUBMITTED: February 17, 1959

Card 3/3

PLOTNIKOV, Yu.N.; TIMOFEYEVA, Ye.A.; SHUYKIN, N.I.

Conversions of n.-hexane on an aluminum-chromium-potassium catalyst under reduced pressure. Neftekhimiia 4 no.2:225-228 Mr-Ap'64 (MIRA 17:8)

ZINGER, A.S.; PLOTNIKOV, Yu.N.

Geothermal characteristics of the Paleozoic sediments of the Lower Volga Valley. Geol. i geofiz. no.5:42-44 '64. (MIRA 17:9)

1. Nizhne-Volzhskiy nauchno-issledovatel'skiy institut geologii i geofiziki.

PLOTNIKOV, Yu. N.

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66488

SOV/20-129-1-35/64

AUTHORS: Timofeyeva, Ye. A., Shuykin, N. I., Corresponding Member AS USSR, Plotnikov, Yu. N., Kleymenova, V. M.

TITLE: Dehydrogenation of n-Nonane on an Aluminum-Chromium Catalyst

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 129, Nr 1, pp 128-130 (USSR)

ABSTRACT: In connection with previous investigations (Refs 1, 2) the authors wanted to dehydrogenate n-alkanes with higher molecular weight on the catalyst mentioned in the title. Data from publications are very scarce (Ref 3). The investigations were carried out at various temperatures and volume rates. The method described earlier (Ref 2) was applied. The gas formed due to reaction contained 92-97% hydrogen, 1.5 - 3.5% unsaturated and 1.0 - 4.5% saturated hydrocarbons. Table 1 and figure 1 show the results. Table 1 shows that with a volume rate of 2.1 h^{-1} the olefin content is increased from 8% to not more than 14-15% if the temperature increases from 400 to 475°. At the same time the content of aromatic hydrocarbons increases considerably, namely from traces to 15-16%. Thus a temperature of 400° is optimum with regard to the selective reaction progress of dehydrogenation.

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Dehydrogenation of n-Nonane on an Aluminum-Chromium Catalyst SOV/20-129-1-35/64

An increase in volume rate from 2.1 h^{-1} to 4.2 h^{-1} hardly changes the olefin yield; at the same time the content of aromatic hydrocarbons decreases from 15-16% to 10-12%. In order to investigate the composition of unsaturated hydrocarbons the product of catalysis was conducted over silica gel treated with HCl_2 and hydrogen peroxide (according to A. V. Topchiyev et al. (Ref 4)). Thus the paraffin part of the gas produced and a 95% concentrate of unsaturated hydrocarbons were separated. The latter was analyzed by means of the Raman spectra. It was found that olefins consist of nonene-4 mainly, although the presence of other nonenes may also be possible. The paraffin part seems to consist of pure n-nonene. Isoalkanes with a tertiary carbon atom are missing (Ref 5). Thus the investigation proved the possibility of selectively dehydrogenating n-nonane below a nonene yield of 8-9% and without considerable aromatization reaction. There are 1 figure, 1 table, and 5 references, 4 of which are Soviet.

ASSOCIATION: Institut organicheskoy khimii im. N. D. Zelinskogo Akademii nauk SSSR (Institute of Organic Chemistry imeni N. D. Zelinskiy of the Academy of Sciences, USSR)

SUBMITTED: July 11, 1959

Card 2/2

PLOTNIKOV Yu. N.

SOV/62-58-7-17/[illegible]

AUTHORS: Timofeyeva, Ye. A., Tsykin, N. I., Smirnov, V. ..., Dobrynina, T. P., Plotnikov, Yu. N., Petryayeva, O. ...

TITLE: The Dehydrogenation of Hydrocarbons of Different Structure in the Presence of Alumino-Chromium-Potassium Catalysts (Degidrogenizatsiya uglevodorodov razlichnogo stroyeniya v prisutstvii alyumokhromokaliyevogo katalizatora)

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye khimicheskikh nauk, 1958, Nr 7, pp. 895-899 (USSR)

ABSTRACT: It is taken for sure that in the presence of oxide catalysts on certain conditions aromatic hydrocarbons are formed from alkanes having 6 and more carbon atoms in the main chain. Therefore they are not suited for a direct cyclization (Refs 1, 5). In the investigation of the aromatization of alkanes and isoalkanes greatest attention was directed to the formation of aromatic hydrocarbons and less attention to the yield (and the structure) of saturated hydrocarbons. In the present paper the authors deal with the reactions of hydrocarbons of different structure (C_5, C_6, C_8) in the presence of alumino-chromium-potassium catalysts. At 500°

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The Isomerization of Hydrocarbons of Different Structure in the Presence of Alumina-Chromium-Potassium Catalysts

(on the conditions assumed) high yields of the corresponding unsaturated hydrocarbons (30 to 46 % in one passage) could be obtained from isohexanes and isooctane. There are 1 figure, 1 table, and 8 references, 5 of which are Soviet.

ASSOCIATION: Institut organicheskoy khimii im. N. D. Zelinskogo Akademii nauk SSSR
(Institute of Organic Chemistry imeni N. D. Zelinskiy, AS USSR)

SUBMITTED: February 17, 1958

5(2)

AUTHORS: Timofeyeva, Ye. A., Shuykin, N. I., Corresponding Member, AS USSR, Plotnikov, Yu. N., Kleymenova, V. M.

SOV/20-125-6-27/61

TITLE: Dehydrogenation of n-Hexane on an Aluminochromium Catalyst (Degidrogenizatsiya n-geksana na alyumokhromovom katalizatore)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 125, Nr 6, pp 1272-1274 (USSR)

ABSTRACT: A survey of publications on the reaction mentioned in the title (Refs 1-2) shows that neither the instructions concerning the reaction nor the yield of hexenes nor the formation of aromatic hydrocarbons under the given conditions have been hitherto discussed. Papers on the afore-mentioned reaction on oxide catalysts lack. Further references follow (3-6). Table 1 shows the data given in the publications concerning the reaction mentioned in the title in the presence of chromium and with the aromatization of n-heptane. This shows that catalyzates have hitherto been obtained by various research workers which contained considerably less unsaturated hydrocarbons than aromatic ones. On the strength of their investigations carried out in the last years the authors drew the conclusion that it is possible to

change considerably the ratios of the yields of the two afore-mentioned hydrocarbon types, i.e. from 0.14 to 2.11 by changing the production of the catalysts mentioned in the title, furthermore, by the introduction of oxides of alkali metals, finally by changing the instructions concerning the reaction. The catalyst without alkaline additions was the best of all catalysts investigated, as far as the maximum yields of unsaturated hydrocarbons are concerned. It was produced by the saturation of aluminum oxide with ammonium bichromate solution. Unsaturated hydrocarbons with a yield of 20% and not more than 14% benzene were obtained from n-hexane at 500° and a rate of passage of 0.5 h^{-1}. It was the authors' object to suppress the aromatization even more in this investigation. All factors were investigated for this purpose: temperature, rate of passage, and individual parts of the catalyzate were analyzed etc. Table 2 and figure 1 show the results. The gas produced by the transformations of n-hexane at 475 and 500° contained 90.6-95.3% hydrogen, up to 1.8% unsaturated hydrocarbons, and 2.7-7.5% alkanes. The temperature rise within the afore-mentioned range increases the yield of hexenes only by 2%, that of benzene,

however, by 9-13%. Thus, it was found that the dehydrocyclization of n-hexane practically does not take place under the given conditions, whereas hexenes are produced in rather considerable quantities. The result is of general importance since the authors succeeded in suppressing the aromatization of an n-alkane which is capable of immediate dehydrocyclization in the presence of an aluminochromium catalyst. The dehydrogenation of n-hexane is rather considerable. There are 1 figure, 2 tables, and 8 references, 6 of which are Soviet.

ASSOCIATION: Institut organicheskoy khimii im. N. D. Zelinskogo Akademii nauk SSSR (Institute of Organic Chemistry imeni N. D. Zelinskiy of the Academy of Sciences USSR)

SUBMITTED: January 30, 1959

5(4) SOV/62-59-8-15/42

AUTHORS: Timofeyeva, Ye. A., Smirnov, V. S., Plotnikov, Yu. N.

TITLE: Effect of Temperature and Volume Rate on the Dehydrogenation of n-Hexane According to Its Aromatization Conditions

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 8, pp 1432-1437 (USSR)

ABSTRACT: As an introduction some methods already known in publications and concerning the aromatization of alkanes are discussed. Special mention is made of Moldavskiy's, Kamusher's and Kobyl'skaya's method (Ref 2). In the present paper the behavior of cyclohexane in the presence of typical dehydrogenation catalysts of the composition Al_2O_3, Cr_2O_3, K_2O (90.7 : 5.6 : 3.7 mol%) is investigated. Experimental yields were compared to the equilibria which were determined by thermodynamic calculations. The dehydrogenation of n-hexane was accompanied by aromatization in which much more benzene than olefines was formed. The method used has already been described in reference 6. The refractive index, iodine number, and aromatic hydrocarbon content (according to the method of relative dispersion) were determined in the liquid catalysate. The gas analysis was carried out in a VTI-2 unit. Characteristic data found by the experiments are compiled in tables 1-4.

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Effect of Temperature and Volume Rate on the Dehydrogenation of n-Hexane According to Its Aromatization Conditions

It can be seen from the results that the hexane yield is independent of temperature change and volume rate whereas the benzene yield increases with a mounting temperature but decreases with an increasing volume rate. The thermodynamic calculations carried out show that a maximum of 73% of the amount of cyclohexane corresponding to the state of equilibrium can be obtained. The authors conclude by thanking N. I. Shuykin for his advice and the possibility to carry thru their work in the Laboratory of Organic Catalysis of the Institut organicheskoy khimii AN SSSR (Institute of Organic Chemistry of the Academy of Sciences, USSR). There are 2 figures, 4 tables, and 12 references, 10 of which are Soviet.

ASSOCIATION: Institut organicheskoy khimii im. N. D. Zelinskogo Akademii nauk SSSR
(Institute of Organic Chemistry imeni N. D. Zelinskiy of the Academy of Sciences, USSR)

SUBMITTED: November 14, 1957

Card 2/2

SOV/62-58-7-18/26

AUTHORS: Shuykin, N. I., Timofeyeva, Ye. A., Dobrynina, T. P., Plotnikov, Yu. N., Petryayeva, O. S., Klegmenova, V. M.

TITLE: The Reactions of N.Alkanes With a C_5-C_9 Structure in the Presence of Alumino-Chromium-Potassium Catalysts (Prevrashcheniya n.alkanov sostava C_5-C_9 v prisutstvii alyumokhromokaliyevogo katalizatora)

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye khimicheskikh nauk, 1958, Nr 7, pp. 896-898 (USSR)

ABSTRACT: The production of alkenes and alkadienes by means of the catalytic dehydration of the alkanes is of scientific and practical interest. In the present brief report the authors describe the reaction of n.alkanes (from pentane to nonane) in the presence of alumino-chromium-potassium catalysts of high activity and stability in the dehydration of iso-pentane. It was shown that on the conditions assumed catalysts could be obtained from these alkanes which contained 8-29 % of unsaturated and 39-59 % of aromatic hydrocarbons. Finally the authors point to the fact that after the dehydration of

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The Reactions of N.Alkanes With a C_5-C_9 Structure in the Presence of Alumino-Chromium-Potassium Catalysts

the C_6-C_9 n.alkanes they obtained catalysts which contained more than 14 % of alkenes. There are 1 figure and 5 references, 5 of which are Soviet.

ASSOCIATION: Institut organicheskoy khimii im. N. D. Zelinskogo Akademii nauk SSSR
(Institute of Organic Chemistry imeni N. D. Zelinskiy, AS USSR)

SUBMITTED: February 17, 1958

Card 2/2

S/204/62/002/004/004/019
E071/E433

AUTHORS: Shuykin, N.I., Timofeyeva, Ye.A., Plotnikov, Yu.N., Dobrynina, T.P., Petryayeva, G.S., Smirnov, V.S.

TITLE: The production of alkenes of a composition C_6-C_{10} by catalytic dehydrogenation of alkanes

PERIODICAL: Neftekhimiya, v.2, no.4, 1962, 457-465

TEXT: The reaction of dehydrogenation of alkanes (C_6-C_{10}) was investigated in order to find appropriate catalysts and conditions for selective production of the corresponding alkenes, as well as to study the possibility of controlling reactions of dehydrogenation, dehydrocylization and cracking. The present paper is a generalization of the authors' researches on these problems. It was shown on examples of 2-methylpentane, 3-methylpentane and 2,3-dimethylbutane that alkanes C_6, the long chain of which contains less than 6 carbon atoms, are comparatively easily dehydrogenized on an alumochromopotassium catalyst at 500°C and a volume velocity of 0.5 h^{-1}, yielding from 86 to 89% of catalysate containing from 32 to 40% of alkenes. Conditions for dehydrogenation of 2,2-dimethylbutane were found under which

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The production of alkenes ...

96.5% yield of catalysate, containing 10.4% of 3,3-dimethylbutene-1 (practically equilibrium yield) and 4.6% of cracking products were obtained (no details given). Some catalysts and process conditions for selective dehydrogenation of n-hydrocarbons C_6-C_{10} were found under which about 10% yields of corresponding alkenes were obtained. The possibility of selective dehydrogenation of n.alkenes (C_6-C_{10}) into alkenes was indicated by comparison of results obtained with various catalysts which pointed out the existence of two kinds of active centres on alumochromium catalysts - dehydrogenating and dehydrocyclizing. The activity of dehydrocyclizing centres can be considerably lowered by a treatment of the catalyst with cyclopentadiene or furfurole with subsequent regeneration. The possibility of controlling dehydrogenation, dehydrocyclization and cracking reactions by carrying out the process in a fluidized bed of an appropriate catalyst was demonstrated, e.g. on dehydrogenation of n.nonane over Al_2O_3 + Cr_2O_3 catalyst at 500°C selective hydrogenation; at 600°C dehydrogenation and dehydrocyclization; with K-5 catalyst at 600°C - dehydrogenation and cracking with Al_2O_3 + Cr_2O_3 + K O catalyst at 600°C - dehydrogenation with

Card 2/3

S/062/60/000/012/010/020
B013/B055

AUTHORS: Shuykin, N. I., Timofeyeva, Ye. A., Plotnikov, Yu. N., and Andreyev, N. S.

TITLE: Composition of the Products of Dehydration of C_6 - C_9 n-Alkanes Over Aluminum-chromium-potassium Catalyst

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1960, No. 12, pp. 2173-2177

TEXT: In the present paper the authors studied the structure of unsaturated and aromatic hydrocarbons, but above all the composition of alkenes formed from n-alkanes at 500°C over an aluminum-chromium-potassium catalyst and a volume velocity of 0.5 h^{-1}. n-hexane, n-heptane, n-octane and n-nonane were used for this reaction. The unsaturated hydrocarbons formed were found to consist mainly of alkenes. As regards number of carbon atoms, they correspond to the initial alkanes and have double bonds in the positions 2, 3 or 4. The catalyzate of n-hexane was found to contain 1-hexene also, but in much smaller amounts than 2- and 3-hexenes. The catalyzates of n-heptane, n-octane, and n-nonane possibly contain other alkenes in addition to the 2-heptene, 4-octene, and 4-nonene actually found. The quantities contained, however, are so small that they were not detectable in the Raman spectra.

Composition of the Products of Dehydration of C_6 - C_9 n-Alkanes Over Aluminum-chromium-potassium Catalyst

S/062/60/000/012/010/020
B013/B055

All catalyzates were found to contain dienes, the structures of which could not yet be established exactly. The structure of the aromatic hydrocarbons formed from n-alkanes becomes more complicated as the molecular weight of the initial alkane increases. n-hexane forms benzene, n-heptane toluene, n-octane mainly xylenes and ethyl benzene as well as lower-boiling aromatic hydrocarbons, benzene and toluene. The aromatic hydrocarbons formed from n-nonane consist mainly of methyl ethyl benzene, trimethyl benzene, and n-propyl- and isopropyl benzenes. Apart from these, the catalyzate contains lower-boiling hydrocarbons, benzene, toluene, and ethyl benzene. There are 5 tables and 5 references: 3 Soviet and 2 British.

ASSOCIATION: Institut organicheskoy khimii im. N. D. Zelinskogo Akademii nauk SSSR
(Institute of Organic Chemistry imeni N. D. Zelinskiy of the Academy of Sciences USSR)

SUBMITTED: July 10, 1959

Card 2/2

NIKOLNIKOV, Ya.P. (Moskva)

Quadratic functionals ensuring an aperiodic transient. Avtom. i telem. 25 no.7[illegible] Jl '65.

(MIRA 18:8)

PLOTNIKOV, Yu.V. (gorod Moskva)

Young automobile and motorcycle drivers. Fiz.v shkole 14 no.1:92-94 Ja-F '54. (MLRA 7:1)
(Automobile drivers) (Motorcycles)

VETYUKOV, M.M.; AGYLBAYEV, V.A.; PLOTNIKOV, Yu.V.

Physicochemical properties of systems fused salt - metal.
Trudy IFI no.23:35-42 '63. (MIRA 17:11)

PLOTNIKOV, Yu.V.; FILIPPOVA, V.S., red.; SHCHEPTEVA, T.A., tekhn.red.

[Group of third grade drivers] Kruzhok shoferov tret'ego klassa. Moskva, Gos. uchebno-pedagog. izd-vo M-va prosv. RSFSR, 1957. 55 p. (MIRA 11:3)

1. Russia (1917- R.S.F.S.R.) Glavnoye upravleniye shkol. (Automobile drivers)

SHUYKIN, N.I.; TIMOFEYEVA, Ye.A.; DOBRYNINA, T.P.; PLOTNIKOV, Yu.N.; PETRYAYEVA, G.S.; GAYVORONSKAYA, G.K.

Catalytic dehydrogenation of isohexanes. Izv.AN SSSR Otd.khim. nauk no.8:1457-1465 Ag '62. (MIRA 15:5)

1. Institut organicheskoy khimii im. N.D.Zelinskogo AN SSSR.
(Hexane) (Dehydrogenation)

L 00738-66

ACCESSION NR: AP5021994

UR/0286/65/000/014/0072/0073
621.86.061.3

AUTHOR: Plotnikov, Yu. P.; Inyutsin, N. I.; Merkotan, A. G.

TITLE: A hoisting device for unit loads. Class 35, No. 172971

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 14, 1965, 72-73

TOPIC TAGS: hoisting equipment, crane

ABSTRACT: This Author's Certificate introduces a hoisting device for unit loads. The device is designed chiefly for reinforced concrete articles stacked in a parallel row. The device consists of a frame with extensible claw grips suspended from the crane hoist hook. The unit is designed for simultaneously hoisting a row of articles of various lengths from a stacked pile and for high operational reliability. Each of the extensible claw grips mounted on one side of the frame is individually driven by a pneumatic cylinder with its rod hinged to the claw grip.

ASSOCIATION: none

SUBMITTED: 25May64 ENCL: 01

NO REF SOV: 000 OTHER: 000 SUB CODE: IE

Card 1/2

L 00738-66

ACCESSION NR: AP5021994

ENCLOSURE: 01

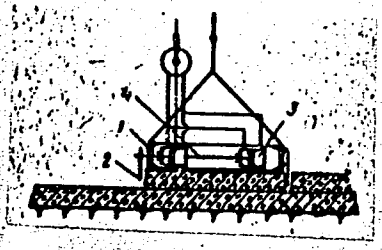

Fig. 1. 1--frame; 2--extensible claw grip; 3--pneumatic cylinder; 4--cylinder rod

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L 2585-66 EWT(d)/EWP(v)/EWP(k)/EWP(h)/EWP(l)

ACCESSION NR: AP5019396 UR/0103/65/026/007/1145/1152
62-505

37
36
13

AUTHOR: Plotnikov, Yu. P. (Moscow)

TITLE: Quadratic functionals guaranteeing an aperiodic transient process

SOURCE: Avtomatika i telemekhanika, v. 26, no. 7, 1965, 1145-1152

TOPIC TAGS: automatic control system, 14

ABSTRACT: For linear systems with a constant matrix, the selection is considered of such a performance (quality) criterion that the system transition is optimal and belongs to a definite class, e.g., an aperiodic transition. A set of equations $y = Ay + bu$ describing transients in a plant is considered; here, $y = \{y_i\}$, $i = 1, 2, \ldots, n$, $u = \{u_k\}$, $k = 1, 2, \ldots, r$, with fixed matrices A (of the nxn type) and b (of the nxr type) whose column-vectors $b, Ab, \ldots, A^{n-1}b$ are linearly independent; u is a piecewise-smooth vector function of the variable t. Given are

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ACCESSION NR: AP5019396

the arbitrary initial conditions $y(0) = y_0$ and a functional $J(y_0, u) = \int_0^\infty (y'Cy + u'Du)\,dt$, with the integrand quadratic form of variables y and u being positive definite. Numerical matrices are found, in the positive-definite class, for which the minimum of the above functional lies in the class of aperiodic functions. An application of the above solution to an isoperimetric problem of the theory of analytical design is indicated. "The author wishes to thank A. M. Letov for stating and discussing the problem." Orig. art. has: 2 figures and 60 formulas.

ASSOCIATION: none

SUBMITTED: 02Dec64 ENCL: 00 SUB CODE: IE

NO REF SOV: 006 OTHER: 000

Card 2/2

KACHELKIN, L.I.; YURCHENKO, K.S.; PLOTNIKOV, Yu.V.

"DU-2" chipper. Bum.prom. 38 no.4:19-20 Ap '63. (MIRA 16:5)

1. TSentral'nyy nauchno-issledovatel'skiy institut mekhanizatsii i energetiki lesnoy promyshlennosti.
(Woodpulp industry—Equipment and supplies)

LUNEVA, A., domokhozyayka; PLOTNIKOVA, A., lifter; YEGOROVA, N.; GANTSEV, M., slesar'-montazhnik; GORBUNOV, A.

In order to keep in a good mood. Zhil.-kom.khoz. 12 no.6:30-31 Je '62. (MIRA 15:12)

1. Zaveduyushchaya priyemnym punktom "Akademgorodka" (for Yegorova). 2. Vostoktekhmontazh (for Gantsev). 3. Direktor bani i prachechnoy No.3 g. Novosibirsk (for Gorbunov).
(Novosibirsk—Baths, Public)
(Novosibirsk—Laundries, Public)

ZAFREN, S.Ya., kand.sel'skokhoz.nauk; IVANOV, Yu.A., aspirant; PLOTNIKOVA, A.F., mladshiy nauchnyy sotrudnik

Increasing the forage quality of straw. Zhivotnovodstvo 23 no.2: 22-23 F '61. (MIRA 15:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut kormov imeni V.R.Vil'yamsa.

(Straw as feed)

TETERIN, G.A.; KOCHNEV, M.I.; PLOTNIKOVA, A.F.

Deoxidation of blister copper. TSvet.met. 35 no.8:27-30 Ag '62. (MIRA 15:8)
(Copper—Metallurgy)

L 6663-65 EWT(m)/EWP(k)/EWP(q)/EWP(b) Pf-4 AEDC(a) RDW/JD 51

ACCESSION NR: AP4042602 S/0076/64/038/007/1851/1852

AUTHOR: Kochnev, N. I.; Plotnikova, A. F.

TITLE: Reactivity of copper selenide during oxidation

SOURCE: Zhurnal fizicheskoy khimii, v. 38, no. 7, 1964, 1851-1852

TOPIC TAGS: copper selenide oxidation, oxidation, copper selenide, chemical kinetics, oxidation rate

ABSTRACT: A study was made of the oxidation kinetics of copper selenide in the 550 - 900 C temperature range. Copper selenide used was prepared from copper powder (containing 99.67 % Cu, 0.006 % Fe) and 99.99 % pure selenium. The obtained selenide contained 61.46 % Cu and 38.60 % Se. The homogeneity of the obtained alloy was verified by microstructural analysis (performed by N. G. Moglev) which showed that it is uniform and comprises a single phase system. The rate of reaction, measured in a circulatory vacuum set-up, was determined from the loss of weight of the investigated sample over temperature intervals which are as small as possible (3 - 5 deg). This was done by means of two concentric furnace windings. The temperature measurements were done by means of a chromel-alumel thermocouple with

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L 6663-65

ACCESSION NR: AP4042602

accuracy of ± 0.25 deg. The results of this investigation are shown in Figure 1 of the enclosure in terms of quantity n (weight samples) as a function of temperature. This curve shows the change of the reactivity of copper selenide in an oxidizing atmosphere. One may judge from the slope of the curve that this selenide has the greatest reactivity up to 600 C. As the temperature is increased to 900 C the rate of the oxidation of selenide decreases which may be associated with the change of structure of selenide as well as of solid products of the reaction. It is thus concluded that kinetics of the oxidation of copper selenide are determined not only by the temperature, but also by structural changes of the substance itself and its components. Orig. art. has: 1 figure.

ASSOCIATION: None

SUBMITTED: 23Jul63 ENCL: 01

SUB CODE: IC NO REF SOV: 008 OTHER: 001

Card 2/3

L 6663-65

ACCESSION NR: AP4042602

ENCLOSURE: 01

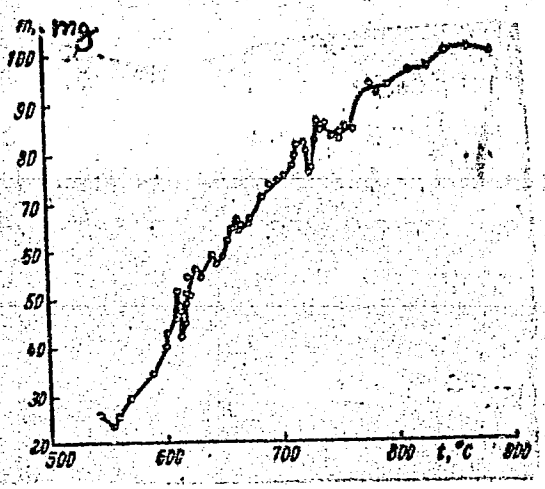

Fig. 1. Weight of sample as a function of temperature.

Card 3/3

KOCHNEV, M.I.; PLOTNIKOVA, A.F.

Regularity of changes in the electric resistivity of cobalt and copper arsenides. Trudy Inst.met.UFAN SSSR no.5:93-104 '60. (MIRA 13:8)
(Cobalt arsenides--Electric properties)
(Copper arsenides--Electric properties)

KOCHNEV, M.I.; PLOTNIKOVA, A.F.; STARKOV, L.N. (Sverdlovsk)

Temperature characteristics of the process of oxidation of copper sulfide. Izv.AN SSSR. Otd.tekh.nauk no.3:82-88 Mr '58.
(MIRA 11:4)

1. Institut metallurgii Ural'skogo filiala AN SSSR.
(Oxidation) (Copper sulfides)

KOCHNEV, M.I.; PLOTNIKOVA, A.F. (Sverdlovsk)

Kinetics of the reduction of magnetite at critical ranges of iron transformations. Izv. AN SSSR. Otd. tekh. nauk no.4:118-121 Ap '58. (MIRA 11:6)

1.Institut metallurgii Ural'skogo filiala AN SSSR.
(Magnetite--Metallurgy)

PLOTNIKOVA, A.F

24-58-3-9/38

AUTHORS: Kochnev, M.I., Plotnikova, A.F. and Starkov, L.N. (Sverdlovsk).

TITLE: Temperature Features of the Process of Oxidation of Copper Sulphide (Temperaturnyye osobennosti protsessa okisleniya sul'fida medi)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, 1958, Nr 3, pp 82-88 (USSR)

ABSTRACT: Modern conceptions on the changes in the electron structure of atoms and their influence on the character of the chemical bond forces, gained from the study of semi-conductors, justify a more thorough analysis of various phenomena involved in metallurgical processes. In earlier work in this field, relating to compounds of heavy non-ferrous metals, the team of the authors of this paper established the existence of a temperature correspondence in the changes of the properties of these compounds and of their components. The aim of the work described in this paper was to study the interrelation between the temperature changes and the properties of copper and sulphur and the properties of the simple compound Cu_2S formed from these. Cu_2S was chosen for investigation due to the fact that it is one of the basic components of the raw materials for which new processes of roasting and smelting are being developed. Two specimens were investigat-

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Temperature Features of the Process of Oxidation of Copper Sulphide.

ed which were prepared synthetically by smelting, the respective compositions being the following: 78.9% Cu, 21.1% S and 79.1% Cu, 20.9% S (the theoretical composition being 79.8% Cu, 20.2% S). In both cases the composition was in the range of solid solutions of sulphur in Cu_2S. The differences in the composition of the two specimens proved to be of little importance. The experiments were carried out mainly with sulphide grains of the sizes 0.50 to 0.63 mm. Oxidation of the sulphide was carried out in a vacuum set-up, a sketch of which is shown in Fig.1, p.83, using the method of circulating air in a closed system, drawing it through a layer of the charge which is heated to a certain temperature; the gases obtained after drawing off the air through the charge were caught by a device in which cooling by means of liquid nitrogen was applied for the purpose of freezing out sulphurous acid anhydride and sulphuric anhydride. According to Averbukh, B.D. (Ref.7) the quantity of forming sulphuric anhydride under these conditions is very low and, therefore, was not determined separately. The investigations were carried out with a constant initial air pressure in the system

Temperature Features of the Process of Oxidation of Copper Sulphide.

of 408 mm and a constant temperature of the charge, which were established during each measurement of oxygen consumption after three minutes. The total duration of the experiment was 21 or 30 mins. The graph, Fig.2, gives the change in the speed of oxidation of Cu_2S during continuous heating. The graph, Fig.3, gives the temperature dependence of the coefficient of electrical resistance of the copper. The graph, Fig.4, gives the temperature dependence of the oxidation speed of copper sulphide along a fresh surface. The graph, Fig.5, gives the temperature dependence of the quantity of copper which is present in the form of oxides and sulphate in the residue on the degree of oxidation of Cu_2S.

In Fig.6 the consumption of oxygen and the yield of sulphurous acid anhydride as a function of the temperature are graphed. It was established that the speed of oxidation of Cu_2S does not change continuously with temperature but is complicated by a number of anomalous deviations within narrow temperature ranges. The temperatures of the narrow deviations in the kinetics of oxidation of copper sulphide are critical temperatures for pure copper and pure sulphur, the manifestation of which is considered as being the result

Temperature Features of the Process of Oxidation of Copper Sulphide.

of changes in the electron structures of the atoms with increasing temperature. The character of the changes in the speeds of oxidation of the copper sulphide at critical temperatures is elucidated and the limits of anomalous temperature ranges were determined; in most cases the sharp fluctuations in the oxidation speed reach 20 to 30% and take place in the temperature range 5 to 15°C. On the basis of study of the oxidation isotherms, the degree of utilisation of the oxygen and the yield of sulphurous acid anhydride and of the influence of the oxidation duration, the conclusion is arrived at that the determining factor in the process of oxidation of Cu_2S at temperatures up to 450°C is the formation of sulphate. There are 6 figures and 12 references, 11 of which are Soviet, 1 English.

ASSOCIATION: Institut metallurgii Ural'skogo filiala, AN SSSR (Institute of Metallurgy, Ural Branch Ac.Sc., USSR)

SUBMITTED: January 3, 1957.

Card 4/4 1. Copper sulfide--Oxidation 2. Temperature--Effects

PLOTNIKOV, A.F.

Oxidation of seleniferous copper. N. P. Diev, M. I. Ch
Kochnev, A. F. Plotnikova, and T. N. Zaldman. J.
Appl. Chem. U.S.S.R. 26, 553-9(1953)(Engl. translation).
See C.A. 48, 5021c. H. L. H.

(3) AM 7147

SOV/24-58-4-22/39

AUTHORS: Kochnev, M.I. and Plotnikova, A.F. (Sverdlovsk)

TITLE: Kinetics of Reducing Magnetite at Temperatures at Which Transformation of Iron Takes Place (Kinetika vosstanovleniya magnitnogo zheleznyaka pri temperaturakh prevrashcheniy zheleza)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, 1958, Nr 4, pp 118 - 121 (USSR)

ABSTRACT: In earlier work one of the authors of the paper found that there is a direct relation and a temperature correspondence between the changes taking place in various metal compounds and the changes in the properties of the individual elements forming these compounds. In this paper, the authors aimed at verifying this conclusion for iron oxides and thus to try and explain anomalous phenomena taking place in reduction processes. To bring the theoretical investigations nearer to industrially used materials, the authors used in the experiments magnetite and not pure oxides. The composition of the ore was as follows: 51.1% Fe, 22.9% FeO, 0.18% MnO, 12.0% MgO, 0.55% CaO, 1.74% Al_2O_3, 9.4% SiO_2, 2.6% S, 0.05% Cu. The kinetics of

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Kinetics of Reducing Magnetite at Temperatures at Which Transformation of Iron Takes Place

reduction were investigated on a circular vacuum test rig (described in an earlier paper) (Ref 20) inside a hydrogen atmosphere; the initial pressure was 408 mm, hydrogen was sucked through a layer 25 mm high, weighing 7 g, with particle dimensions between 0.4 and 0.6 mm. The temperature in the layer was measured with an accuracy of $\pm$ 1 °C; the circulation speed was 600 ml./min with a volume of the system of 800 ml. The gaseous reaction products were frozen out in a trap which was cooled by liquid nitrogen. The ore was heated to the desired temperature in vacuum (10^{-2} to 10^{-3} mm Hg). Following that, a quantity of hydrogen was introduced which was equal in every case, maintaining the pressure constant. The speed of reduction was judged from the consumption of hydrogen in the closed system which was measured every minute. Every three minutes the system was joined to a vacuum and, after that, the temperature was readjusted and the gaseous phase renewed. It could, therefore, be assumed that a number of successive measurements, carried out at 3 min intervals, provided the isotherm of the reduction of the ore. At

Kinetics of Reducing Magnetite at Temperatures at Which Transformation of Iron Takes Place

each temperature the experiments were carried out with a fresh ore specimen. Since the aim of the work was to elucidate the existence of a relation between the changes in the properties of the iron, at temperatures at which it is known that phase transformations take place, and the kinetics of reduction of iron oxides under equal conditions, the investigations were carried out in the temperature range 700 to 910 °C. In this temperature range magnetic as well as polymorphous transformations take place in the iron at 768 and 906-910 °C, respectively. The speeds of reduction of magnetite, expressed in terms of hydrogen consumption during the first 3 min as a function of the temperature, are graphed in Figure 1. It can be seen that the graph contains several anomalous sections. The obtained results justify revision of certain views expressed

Kinetics of Reducing Magnetite at Temperatures at Which Transformation of Iron Takes Place

on the kinetics of reduction of iron oxides. In the first instance, it is quite evident that sintering phenomena, changes in the porosity and recrystallisation of the studied substances and in the reaction products, changes of speed of diffusion and the speed of chemical reactions do occur in the course of variation of the temperature during reduction of the ores and of iron oxides. The most plausible explanation of the anomalous phenomena in the processes of reduction is based on the changes of the state of the iron atoms as a function of the temperature, particularly as regards phase transformations. The obtained results (Figure 1) indicate that the jumps in the speed of reduction at 752-756 °C correspond to the magnetic transformation of the iron and not to the Curie point of the magnetite. Thus, the change in the character of the chemical process at the

Kinetics of Reducing Magnetite at Temperatures at Which Transformation of Iron Takes Place

temperature of magnetic transformation of the iron confirms the conclusion that the anomalous phenomena in the chemical and physical processes at various temperatures are based on the changes in the state of the atoms and not on changes of the crystal lattice. It can be seen from the graph, Figure 2 (temperature coefficient of the electric resistance of iron) that the thermal coefficient of the electric resistance changes appreciably in the temperature range 400 to 450 °C and also at 550 and 650 °C.

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Kinetics of Reducing Magnetite at Temperatures at Which Transformation of Iron Takes Place

The following conclusions are arrived at:
1) The speed of reduction of magnetite with hydrogen decreases in jumps and then again increases within narrow temperature range approaching the following temperatures: magnetic transformation of the iron (752 °C), $Fe_\beta \rightarrow Fe_\gamma$ transformation (906 °C) and at about 820 °C, at which the properties of the iron change considerably.
2) Using the example of the jump-like change in the speed of reduction at temperatures of the magnetic transformation of iron it is shown that the observed anomalies in the kinetics of the process are based on the changes of the electron structure of the iron atoms.
3) The anomalies in the kinetics of reduction of ore are explained more satisfactorily than hitherto from the point of view of transformations taking place in the iron.
4) The results of the here described work can be applied for selecting optimum temperatures for the preparation and processing of ores in the neighbourhood of critical points.

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SOV/24-58-4-22/39

Kinetics of Reducing Magnetite at Temperatures at Which Transformation of Iron Takes Place

There are 2 figures and 27 references, 2 of which are Swedish, 1 German, 1 English and 23 Soviet.

ASSOCIATION: Institut metallurgii Ural'skogo filiala AN SSSR (Institute of Metallurgy, Ural Branch of the Ac.Sc.USSR)

SUBMITTED: March 11, 1957

Card 7/7

PLETNIKOVA, A.F.

PHASE I BOOK EXPLOITATION SOV/4613

Akademiya nauk SSSR. Ural'skiy filial. Institut metallurgii

Voprosy kontrolya i kompleksnogo ispol'zovaniya syr'ya v metallurgii (Problems of Control and Complete Utilization of Raw Materials in Metallurgy) Sverdlovsk, 1960. 194 p. (Series: Its: Trudy, vyp. 5) Errata slip inserted. 1,000 copies printed.

Resp. Eds.: N. I. Kochnev, and V. P. Chernobrovkin, Candidates of Technical Sciences. Ed. of Publishing House: I. M. Dzmin; Tech. Eds.: L. A. Iznodenova, and E. F. Seredkina.

PURPOSE: This collection of articles is intended for technical personnel of metallurgical plants and for members of scientific research institutes.

COVERAGE: The collection contains articles discussing a variety of problems pertaining to ferrous and nonferrous metallurgy. A number of articles describe new methods for investigating the properties of alloys and oxides and review changes which these properties undergo as a result of the effect of temperature and other factors. Findings of studies are summarized in numerous articles and processes to be used for manufacturing ferroalloys and naturally-alloyed steels are suggested. Characteristics of various metal compounds are given and measures for the most efficient utilization of ores are indicated. Some of the articles are devoted to the study of problems of manufacturing ferrous, nonferrous, and rare metals. The selection of topics was made on the basis of the need for material relating to the improvement of the quality control of alloys and the manufacturing processes employed to produce them. No personalities are mentioned. Each article is accompanied by references, most of which are Soviet.

AVAILABLE: Library of Congress

PLOT NIKOVA, A.F.

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USSR.

Kinetics of High-Temperature Oxidation of Copper Selenide. N. P. Diev, M. I. Kochaev, A. F. Plotnikova, and F. N. Zaidman (*Zhur. Prikhl. Khim.*, 1953, 26, (6), 599–604 (in Russian); *J. Appl. Chem. U.S.S.R.*, 1953, 26, (6), 533–539, 635 (in English)).—Specimens of Cu–Se alloys contg. 0·44, 1·77, and 2·47% Se were prepared in the form of hollow cylinders (15 × 10 × 1 mm.) cut from cylindrical rods. The specimen was suspended inside an elect. furnace (through which the air velocity was 100 ml./min.) from the arm of a balance counterbalanced by an electromagnet. The balance was adjusted every 2–3 min., and the voltage supplied to the electromagnet was determined by a compensation method, the change in potentiometer readings corresponding to changes in sample weight, to an accuracy of 10^{-4} g. Isotherms are given showing the oxidation of the alloys and of cathode Cu at 600°–1000° C. In the case of Cu, oxidation proceeded according to a parabolic equation, but considerable parts of the alloy isotherms were not parabolic; initially the oxidation rate was greater than indicated by the parabolic equation, and after the oxidation had continued for some hours it changed from parabolic to linear behaviour. On plotting the log of the rate const. against the reciprocal of the temp., a straight line was obtained for pure Cu, but there was no simple relation for the alloys. At ~800°–900° C. the alloys oxidized more slowly than pure Cu; at other temp., more rapidly. All the oxidation rates increased considerably at 900° C. and in the case of Cu–2·47% Se alloy this was also observed at 600°–700° C.; this is probably connected with phase transformations of Cu_2Se. Analysis of the scales and underlying metal indicated that during oxidation most of the Se passes into the vapour phase, probably as SeO_2; that remaining in the scale is probably in the form of unstable oxidized compounds. The Se content of the metal falls because of dissociation of Cu_2Se and subsequent rapid diffusion of the Se. The rates of vaporization of Se, without oxidation, from Cu–2·47% Se alloy at 600°, 900°, and 1000° C. are ~3·1, ~7·8, and ~47 × 10^{-5} g./cm.²/hr., resp. Tests with the alloy Cu–1·37% Se–1·24% Ag showed that the presence of Ag increased the oxidation rates, except at ~800° C. The use of O instead of air also increased the rate of oxidation, the max. increase being at ~800° C. [Throughout the English version the word melt appears to be a mis-translation of the Russian word for alloy].—G. V. R. T.

PLOTNIKOVA, A.F.

DIYEV, N.P.; PADUCHEV, V.V.; PLOTNIKOVA, A.F.

Interaction of metallic copper with copper matte. Zhur.prikl. khim. 27 no.2:127-135 F '54. (MLRA 7:2)

1. Ural'skiy filial Akademii nauk SSSR. (Copper)

PLOTNIKOVA, A.F.

Chemical Abst.
Vol. 48 No. 5
Mar. 10, 1954
Metallurgy and Metallography

Kinetics of high-temperature oxidation of telluriferous copper. N. P. Lyev, M. I. Kochnev, A. F. Plotnikova, and T. M. Zaldman. *Zhur. Prikład. Khim.* 26, 709–13 (1953).—Oxidation of Cu-Te alloys proceeds according to $a^2 = kt$, where a is amount of O in mg./sq. cm., t is time in hrs., and k is velocity const. In the interval of 750–950°, Cu contg. 0.72% Te oxidizes more slowly than does pure Cu. The width of this interval depends on the compn. of the alloy. V. N. Bednarski

PLOTNIKOVA, A.F.

1826* Kinetics of High-Temperature Oxidation of Selenium Bearing Copper. (Russian.) N. F. Dav, M. J. Kochnev, A. F. Plotnikova and T. N. Zaidman. *Zhurnal Prikladnoi Khimii*, v. 26, no. 6, June 1953, p. 598-604.

It was established that the addition of Se to Cu alloys increases oxidation rate in the temperature range of 600-1000 C. Diagrams, graphs, tables. 12 ref.

PLOTNIKOVA, A. F.

Battelle Technical Review
July, 1954
Metals-Extraction and Refining

9950*. Interaction of Metallic Copper With Copper Mattes. (Russian.) N. P. Diev, V. V. Paduchev, and A. F. Plotnikova. *Zhurnal Prikladnoi Khimii*, v. 27, no. 2, Feb. 1954, p. 127-135.

Results, method of investigation, and dissolution mechanism at 1,000 and 1,200 C. Tables, graphs. 3 ref.

PLOTNIKOVA, A. F.

Chemical Abstracts
May 25, 1954
General and Physical
Chemistry

Oxidation of seleniferous copper. N. P. Dier, M. I. Kochner, A. F. Plotnikova, and T. N. Zaldman. *Zhur. Prikład. Khim.* 26, 506–508(1953).—The kinetics of oxidation of Cu contg. 0, 0.41, 1.77, and 2.47% Cu was investigated. The rate of oxidation between 600 and 1000° increases with Se content, although between 800 and 900° the rate is lower than for pure Cu. The rate-time curves are parabolic. After 1.5 hrs. at 1000°, Se content drops from 2.47 to 2.27% in the metal and to 0.050% in the oxide scale. Adding Ag, as in 1.37% Se-1.24% Ag triple alloy, increases the rate of oxidation. This is of interest in fire refining of Cu.

E. M. Elkin

FLORIKOVA, A. P.
B. N. KUTOVSKI, Zhur Prik Khim, 1940, 13, 576-578

PLOTNIKOVA, A. F.
V. I. LYUBOMILOV, Russ. 59,004, Feb. 28, 1941

PLOTNIKOVA, A.F.,
M. YA. LEVSHUK, ZhPKh 13, 1178-81 (1940)

DIYEV, N.P.; KOCHNEV, M.I.; PLOTNIKOVA, A.F.; ZAYDMAN, T.N.

Kinetics of high-temperature oxidation of copper selenide. Zhur.prikl. khim. 26 no.6:596-604 Je '53. (MLRA 6:7)

1. Institut khimii i metallurgii Ural'skogo filiala Akademii Nauk SSSR.
(Oxidation) (Copper selenide)

DIYEV, N.P.; KOCHNEV, M.I.; PLOTNIKOVA, A.F.; ZAYDMAN, T.M.

Kinetics of high-temperature oxidation of copper telluride. Zhur.prikl. khim. 26 no.7:760-763 Jl '53. (MLRA 6:7)

1. Institut khimii i metallurgii Ural'skogo filiala Akademii Nauk SSSR.
(Copper--Tellurium alloys) (Oxidation)

PLOTNIKOVA, A.F

USSR

Kinetics of high-temperature oxidation of telluriferous copper. N. P. Dicv, M. I. Kochnev, A. F. Plotnikova, and T. N. Zaldman. *J. Appl. Chem. U.S.S.R.* 26, 232-6 (1953)(Engl. translation).—See *C.A.* 48, 2536c.

H. L. H.

PLOTNIKOVA, A.F.

Kinetics of High-Temperature Oxidation of Tellurium-Bearing Copper. N. P. Diev, M. I. Kochnev, A. F. Plotnikova, and T. M. Zaidman (*Zhur. Prikhl. Khim.*, 1950, 23, (7), 783 (in Russian); *J. Appl. Chem. U.S.S.R.*, 1953, 23, (7), 713–716 (in English)).—An investigation was made of the oxidation of two-phase alloys contg. 0·72, 0·84, and 3·75% Te by the method previously described by D. *et al.* (*ibid.*, (6), 598; *M.A.*, 22, 555). Isotherms for the oxidation in air at 600°–1000° C. were parabolic in form. The oxidation rates of the alloys contg. 0·72 and 3·75% Te were almost the same at temp. up to 800° C., but that for the 3·75% Te alloy then increased more rapidly and at 1000° C. (after 3 hr.) was 1½ times the rate for the 0·72% alloy. The parabolic rate const. at various stages in the oxidation were calculated for different temp. and are tabulated. At the start of the oxidation, it was better determined by a linear equation; this resulted from the thin scale having a low resistance to the diffusion of O. Up to 750° C., the alloys all oxidized more rapidly than pure cathode Cu; above 750° C., the reverse was true for a limited range only (up to 1000° C. for the 0·72% Te alloy; up to 920° C. for the 3·75% Te alloy). The rate of oxidation of the 0·72% Te alloy in commercial O was the same as that in air at all temp. investigated, whereas with Cu the rate in O became greater than that in air at temp. > 900° C.

—O. V. H. T.

PLOTNIKOVA, A.F.

USSR

Reaction of metallic copper with chalcopyrite. [illegible] A.F. Diev, V. V. Paduchev, and A. F. Plotnikova. *Zhur. Fiz. Khim.* 27, 119-25(1953)(Russ. translation). *Chem. U.S.S.R.* 27, 119-25(1953)(Engl. translation). See *C.A.* 48, 13390h.

Plotnikova, A.F.

Reaction of metallic copper with chalcopyrite. A. F. Dire, V. V. Paduchev, and A. F. Plotnikova. *Zhur. Prikład. Khim.* 27, 137-35(1954). CI. C.A. 48, 6713b.—Rates of satn. of Cu in chalcopyrite (synthetic) at 1000 and 1200° were detd. by immersing a Cu-wire spiral in the melt for a given length of time *t*. Since no stirring was involved, the reaction was diffusional, and the equation $Y = A(1 - e^{-qt})$ was assumed to hold. The consts. *A* and *q* were calcd., by the least-squares method, from expt. data and a series of empirical equations set up from which the following equations were derived, rates *V*, in kg./sq. m./min., as functions of *k*, Cu content %: $V_{1000} = 3.72 - 459 \times 10^{-2}k - 4.00 \times 10^{-4}k^2$ and $V_{1200} = 61.01 - 0.62k - 6.77 \times 10^{-4}k^2$. With low initial Cu content (17–18%) the rates at 1000 and 1200° were 2.5 — 3.0 and 45–50 kg./sq. m./min. and they dropped smoothly as the Cu content increased. Equil. in the reaction $2Cu + FeS \rightleftarrows Cu_2S + Fe$ was reached at 52–4 and 60–61% Cu at 1000 and 1200°, resp. I. Beneowitz

PLOTNIKOVA, A.F.

Reaction of Metallic Copper with Copper Matte. N. P. Diov, V. V. Paduchev, and A. F. Plotnikova (*Zhur. Prikład. Khim.*, 1954, 27, (2), 127–135). [In Russian.] Detn. of the rates of reaction of Cu with FeS at 1000° and 1200° C.
—G. V. E. T.

SEDLUKHA, Georgiy Andrianovich; FRIDMAN, Osher Moiseyevich; PLOTNIKOVA, A.N., nauchnyy red.; DESHALYT, M.G., ved. red.; YASHCHURZHINSKAYA, A.B., tekhn. red.

[Construction and assemblage in gas pipelaying] Stroitel'no-montazhnye raboty po prokladke gazoprovodov. Leningrad, Gostoptekhizdat, 1963. 156 p. (MIRA 16:7)
(Gas, Natural--Pipelines) (Pipe-laying machinery)

NECHAYEV, M.A.; ISSERLIN, A.S.; MLODOK, B.I.; PLOTNIKOVA, A.N.; STOLPNER, Ye.B., nauchnyy red.; DESHALYT, M.G., ved. red.; YASHCHURZHINSKAYA, A.B., tekhn. red.

[Pocket guide for the gas distribution workers]Karmannyi spravochnik rabotnika gazovogo khoziaistva. Leningrad, Gostoptekhizdat, 1962. 526 p. (MIRA 15:12)
(Gas distribution) (Gas appliances)

NECHAYEV, Mikhail Aleksandrovich; ISSERLIN, Aleksandr Semenovich; MLODOK, Boris Iosifovich; PLOTNIKOVA, Anfusa Nikolayevna; NECHAYEV, M.A., nauchn. red.; RUSAKOVA, L.Ya., ved. red.

[Handbook for workers in the gas industry] Spravochnik rabotnika gazovogo khoziaistva. Izd.2., perer. i dop. Leningrad, Nedra, 1965. 430 p. (MIRA 18:7)

TRIGER, V.A.; SYNCHUK, A.N.; PLOTNIKOVA, D.V.

Activity of transaminase and protein fractions of the blood in myocardial infarction. Vrach. delo no.1:13-17 Ja'64 (MIRA 17:3)

1. Gospital'naya terapevticheskaya klinika (zav. - prof. V.A. Triger) Chernovitskogo meditsinskogo instituta.

Frequency Region.—D. K. Balabukha, L. L. Myasnikov & E. N. Plotnikova. (*Akust. Zh.*, July–Sept. 1956, Vol. 2, No. 3, pp. 248–254.) The principles of an instrument for the measurement of a.f. voltages of the order of a few microvolts in the frequency range 200 c/s–20 kc/s are discussed and some practical details are given. The a.f. voltage was modulated at 24 c/s by a periodically varying capacitance in the input stage of an a.f. amplifier. Various detectors were used.

Plotnikova E.N.

POLAND/Acoustics. J

Abs Jour: Referat Zhur-Fizika, 1957, No 4, 10130

Author : Balabukha, D.K., Myasnikov, L.S., Plotnikova, E.N.
Inst : Leningrad Shipbuilding Institute, USSR
Title : Modulation Method of Measuring Small Electric Voltages in the Audio Frequency Range.

Orig Pub: Acust. Zh., 1956, 2, No 3, 248-254

Abstract: Description of the application of the modulation method for the measurement of small voltages in the audio frequency range. The modulation is effected by means of periodic variations of a capacitor An approximate method is indicated for calculating the input circuit of the circuit and the parameters of the modulators, and suitable nomograms for the purpose are given. A counter-phase circuit for connecting two modulators is proposed and yields simultaneously large values of modulation coefficients and voltage transfer coefficients. The method developed permits measurements against a background that exceeds considerably the intrinsic noise of the measuring portion

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POLAND/Acoustics. J

Abs Jour: Referat Zhur-Fizika, 1957, No 4, 10130

of the apparatus and raises the sensitivity of the instrument by one order of magnitude compared with those usually employed at the present time.

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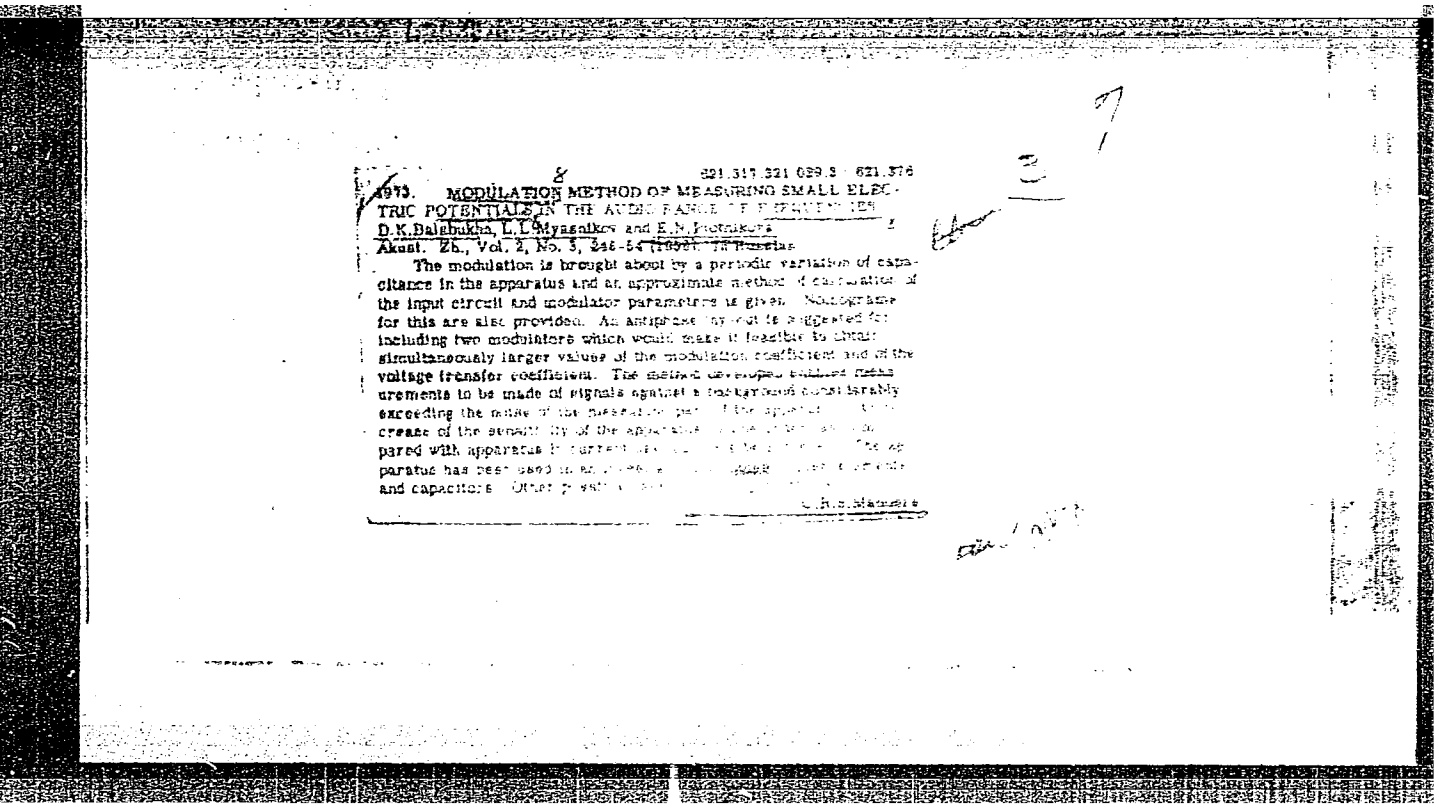

621.317.321.029.3 : 621.376

1973. MODULATION METHOD OF MEASURING SMALL ELECTRIC POTENTIALS IN THE AUDIO RANGE OF FREQUENCIES

D.K.Dalgubkha, L.L.Myasnikov and E.N.Protnikova

Akust. Zh., Vol. 2, No. 3, 246-54 (1956). In Russian.

The modulation is brought about by a periodic variation of capacitance in the apparatus and an approximate method of calculation of the input circuit and modulator parameters is given. Nomograms for this are also provided. An antiphase circuit is suggested for including two modulators which would make it feasible to obtain simultaneously larger values of the modulation coefficient and of the voltage transfer coefficient. The method developed enables measurements to be made of signals against a background considerably exceeding the noise of the measuring part of the apparatus. The increase of the sensitivity of the apparatus [illegible] compared with apparatus in current use [illegible] The apparatus has been used to measure [illegible] and capacitors. [illegible]

AUTHORS: Plotnikova, G., Post-graduate Student, Khmelevskiy, I., Post-graduate Student, Both at the Institute of Mechanics, AS USSR

S/029/60/000/04/013/032
B008/B102

TITLE: On the Competition for the Lenin Prize. Outstanding Work in the Field of the Theory of Stability

PERIODICAL: Tekhnika molodezhi, 1960, Nr 4, p 11 (USSR)

TEXT: In this article the authors give an account on the work by the late scientist Nikolay Gur'yevich Chetayev (deceased October 1959), Corresponding Member Akademii nauk SSSR (Academy of Sciences, USSR) in the field of the theory of stability. In the Twenties, N. G. Chetayev began to further develop the methods of Aleksandr Mikhaylovich Lyapunov who in 1892 solved the general problem of stability of motion. He established the theory of aeroplane stability, solved numerous problems concerning the stability of motion of gyroscopes, projectiles and rockets. Furthermore, N. G. Chetayev devoted much work to the investigation of various problems in theoretical mechanics, and especially, to the optical-mechanical analogy. The problem of the analogy between theoretical mechanics and wave optics has been set already in the middle of the 19th century. 100 years later it was solved by Chetayev after Einstein's suggestion. He stated that the equations of wave optics are similar to the equations which describe the motion

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